ON THE IDENTITY OF SEVERAL SPECIES OF CHALCIDOIDEA (HYMENOPTERA).

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The following notes are presented for publication at this time in order to clear up the identity of the species in question before the references in literature become more complicated. The necessity for some of these changes is to be regretted as they involve the sinking of some rather well known names in synonymy, transferring of others, and the resurrection from synonymy of still others.

FAMILY CALLIMOMIDAE.

Eridontomerus isosomatis Riley.

Stictonotus isosomatis Riley, Rept. Ent. U. S. Dept. Agr., 1881–2, p. 186.
Stictonotus isosomatis Howard, U. S. Dept. Agr. Bur. Ent. Bull, 5, (old series) 1885, p. 45.
Merisus isosomatis Cresson, Syn. Hym. Amer. North of Mexico, 1887, p. 242.
Semiotellus isosomatis Dalla Torre, Cat. Hym., vol. 5, 1898, p. 211.
Eridontomerus primus Crawford, Journ. N. Y. Ent. Soc., vol. 15, 1907, p. 179.
Merisus isosomatis Viereck's Hym. Conn., Bull. 22, Conn. Sta. Geol. and Nat. Hist. Surv., vol. 3, 1916, p. 478 (description).

While attempting to determine some parasitic material recently the writer found it necessary to consult the original description of *Stictonotus isosomatis* Riley. Upon reading the description he was at once impressed with its failure to coincide with the conception of that species current in literature. The description is of an insect with metallic front femora, black median and hind femora, black hind tibiae, and a metallic colored abdomen whereas the species going by that name in the literature has a bright yellow abdomen and yellow legs. An attempt to verify the description by means of the type developed further complications. A single specimen bearing the name and recorded in the type catalog as type of the species was located in the collection of the United States National Museum. The data on the pin and in the type catalog showed this specimen to have been reared by F. M. Webster from Isosoma, February 5, 1885. Since *Stictonotus isosomatis* Riley was described in 1882 from specimens said to have been reared from material received from J. K. P. Wallace of Tennessee, it was at once apparent that the specimen in question could not be Riley's type. Furthermore, this specimen did not correspond to Riley's description nor was it the *Stictonotus isosomatis* of authors, it being instead a female of *Merisus destructor* Say. Search for the true type was finally rewarded by the finding of two pins, one bearing a female mounted on a card point, the other bearing two males similarly mounted. Both pins bore

the old style Division of Entomology breeding number 2246° and in addition a name label in L. O. Howard's handwriting. Upon consulting the records under the number 2246° in the Bureau of Entomology, it was positively determined that the three specimens in question were reared in May 1881 from material received from Mr. J. K. P. Wallace of Andersonville, Tennessee. This data checks exactly with that given by Riley for his types and since the specimens agree in every way with the original description there can be no doubt that they are actually the specimens from which the description was drawn.[1] As represented by these types, *Stictonotus isosomatis* Riley is identical with the Callimomid, *Eridontomerus primus* Crawford. Riley's description antedates that by Crawford and the species will, therefore, have to be known in the future as *Eridontomerus isosomatis* Riley.

How the identity of this species became so confused it is impossible to say. The fact remains that the insect which has been repeatedly referred to under the name of *isosomatis* by Webster, Kelly, and others, and which has been placed at different times in the genera, *Stictonotus*, *Merisus*, and *Semiotellus* is an entirely different species from that to which Riley gave the name. (See *Merisus febriculosus*, p. 238 seq.).

Eridontomerus isosomatis is, so far as present records show, exclusively parasitic in the species of (Isosoma) Harmolita, or joint worm flies, and probably occurs from coast to coast of the United States.

The record in Viereck's Hymenoptera of Connecticut cited above consists of a quotation of Riley's original description coupled with records of occurrence of the species in Connecticut. It is more than likely that the Connecticut breeding records there set forth really refer to *Merisus febriculosus* Girault.

Ditropinotus aureoviridis Crawford.

Ditropinotus flavicoxus Gahan, Proc. Ent. Soc. Wash., 14, 1912, p. 5.

The females of this species are evidently quite variable in color. Types of *aureoviridis*, of which there are eight female specimens in the series, have the entire thorax as well as the middle and hind coxae except apically metallic green, and the abdomen dorsally brown. There is some variation in the extent of the metallic coloration of the coxae, some specimens having them metallic only basally. The type series of *flavicoxus*, on the other hand, which includes eight females, shows the underside of almost the whole thorax from the tegulae downward, all coxae, and in some

[1] Dr. L. O. Howard informs me that he drafted the original description of *Stictonotus isosomatis* for Professor Riley, and he confirms my identification of the type specimens.

specimens the whole propodeum honey-yellow while the abdomen above and below is similarly colored. The mesosternum is more or less metallic. These colorational differences were so striking that the writer had little hesitancy in describing *flavicoxus* as a new species especially since they appeared to be confirmed by two or three very slight sculptural differences. Acquisition of additional material, largely reared has, however, demonstrated that there is almost a perfect gradation in color from the one form to the other. I am now convinced that both forms represent the same species, the two type series probably representing the extremes of variation.

Websterellus harrisi Fitch.

Torymus (sp.) Harris, Rept. on Ins. Inj. to Veg., 1852, p. 442–3 (2nd ed.).
Torymus harrisii Fitch, 7th Rept. Ins. N. Y., 1862, p. 152–3.
Torymus (sp.) Harris, Ins. Inj. to Veg., 1863, p. 556 (Flint ed.).
Websterellus tritici Ashmead, Bull. Ohio Agr. Exp. Sta., 1, 1893, p. 164; Pl. II, figs. 1 and 2; Pl. III, figs. 3–4.
Cryptopristus americanus Girault, Descriptiones Stellarum Novarum, 1917, p. 8.

Fitch's types of this species are apparently lost. At least the writer has failed to locate them in the Fitch collection, or elsewhere in the National Museum.

The description by Fitch, supplemented by that of Harris, agrees in every way with *Websterellus tritici* Ashmead except that the abdomen of *tritici*, when viewed through a binocular microscope, is seen to be rather distinctly reticulately sculptured instead of smooth and polished as stated by Harris. Viewed through a hand lens, however, this sculpture is practically invisible and the whole abdomen has a distinctly shining appearance. Since the description by Harris was undoubtedly drawn with the aid of a hand lens the apparent discrepancy between the description and the type of *tritici* is thus explained. No other parasite upon joint-worms at present known in America, could by any possibility be Fitch's species, and in view of the very satisfactory agreement the writer has no hesitation in declaring *tritici* Ashmead a synonym of *harrisi* Fitch. The species is type of the genus *Websterellus*.

Cryptopristus americanus Girault was described from one female specimen reared from (Isosoma) Harmolita at Wellington, Kansas, by E. G. Kelly. The type has been compared with the types of *tritici* and agrees in every essential detail.

Harris' and Fitch's specimens were from Virginia; the types of *tritici* from Wooster, Ohio; the type of *americana* from Kansas. This comprises the distribution of the species as known at the present time.

FAMILY ENCYRTIDAE.

Eupelmus allynii French.

Pteromalus (sp.) Harris, Ins. Inj. Veg., 1863, p. 556 (Flint edition).

The description by Harris cited above fits exactly the male of *allynii* and agrees with no other known parasite of the joint worm flies (Harmolita). Since Harris did not name the species, the validity of French's name is not affected and the reference is chiefly interesting as constituting a much earlier record of the species in literature.

FAMILY PTEROMALIDAE.

Merisus febriculosus Girault.

(= *Stictonotus isosomatis Authors not Riley*)

Merisus isosomatis Webster, Ins. Life, vol. 5, 1893, p. 90.

Stictonotus isosomatis Webster, U. S. Dept. Agr. Bur. Ent. Bull. 42 (new ser.) 1903, p. 22.

Merisus isosomatis Webster, l. c., p. 33.

Stictonotus isosomatis Webster, Proc. Ent. Soc. Wash., vol. 7, 1905, p. 115.

Stictonotus isosomatis Webster, U. S. Dept. Agr. Bur. Ent. Circ. 66, 1908, p. 4.

Semiotellus isosomatis Webster and Reeves, U. S. Dept. Agr. Bur. Ent. Circ., 106, 1909, pp. 8, 9, fig. 11.

Stictonotus isosomatis Kelly, Journ. Econ. Ent., vol. 3, 1910, p. 202.

Merisus isosomatis Crawford, in Smith's Ins. of New Jersey, 1910, p. 642.

Merisus isosomatis Viereck, Hym. Conn., Bull. 22, Conn. Sta. Geol. Nat. Hist. Surv., vol. 3, 1917, p. 478 (rearing record).

Merisus febriculosus Girault, Descriptiones Stellarum Novarum, 1917, p. 17.

As pointed out in the discussion of *Eridontomerus isosomatis* (ante p. 235) the *Merisus isosomatis* of authors is not *Stictonotus isosomatis* Riley. Luckily it is not necessary to propose a new name for *isosomatis* Riley however, as one is already available in *Merisus febriculosus* Girault. The type material of *febriculosus* consists of a single female from Wooster, Ohio. This specimen was without much doubt collected by Webster although not so labelled. It is identical with numerous other specimens in the collection reared by Webster from joint worm material in Indiana, Michigan, and Ohio, and which form the bases for the several notes published by him.

Whether or not Girault was aware of the fact that *Merisus febriculosus* was identical with the *isosomatis* of authors (not Riley) does not appear. He makes no statement to that effect either with the original description or elsewhere.

This species is a common parasite of various species of Harmolita as shown by the published records cited above as well as numerous unpublished records in the files of the Bureau of Entomology. It also occurs as a parasite of the Hessian fly,

Mayetiola destructor, according to a number of trustworthy rearing records of the Bureau as yet unpublished. In distribution it ranges at least from Maryland to Kansas, as shown by specimens at hand, and it will probably eventually be found to occur over the whole of the United States and Canada where wheat is subject to the attacks of the joint worms and Hessian fly.

Aplastomorpha vandinei Tucker.

Meraporus vandinei Tucker, Can. Ent., vol. 42, 1910, p. 343.
Aplastomorpha pratti Crawford, Proc. U. S. Nat. Mus., vol. 47, 1913, p. 252.
Neocatolaccus australiensis Girault, Mem. Queensl. Mus., vol. 2, 1913, p. 306.
Aplastomorpha australiensis Girault, Mem. Queensl. Mus., vol. 3, 1915, p. 313.

Girault has already stated the above synonymy (Ins. Ins. Mens., 5, 1917, p. 152) but without indicating definitely to what genus the species should be referred. The writer has compared types of *vandinei* and *pratti*. The synonymy of *australiensis* is accepted on authority of Girault.

The genera *Aplastomorpha* Crawford, *Neocatolaccus* Ashmead, and *Zatropis* Crawford are much alike and may eventually have to be synonymized. *Aplastomorpha* may be separated from both the others, however, by the almost total absence of appressed hairs on the thorax and by the fact that the antennae are inserted lower down being distinctly below the middle of face.

Lariophagus distinguendus Foerster.

Pteromalus distinguendus Foerster, Beitr. Monogr. Pteromal., 1841, p. 17, No. 84.
Meraporus calandrae Howard, Rept. Ent., U. S. Dept. Agr., 1880–1881, p. 273.
Meraporus utibilis Tucker, Can. Ent., vol. 42, 1910, p. 341.
Lariophagus distinguendus Kurdjumov, Rev. Russ. Ent., 13, 1913, p. 15.
Lariophagus distinguendus Hase, Sitz. d. Ges. Naturf. Freunde, Berlin, 1919, p. 402.

The above cited publication by Hase gives a very exhaustive account of this cosmopolitan parasite of *Calandra oryzae* and other stored grain pests. *Meraporus utibilis* Tucker is listed as a synonym by Hase.

Previous to receipt of Hase's paper the writer had compared the types of *utibilis* and *calandrae* and had arrived at the conclusion that they were the same species. The type of *utibilis* is a rather small and poorly developed specimen. The national collection contains a series of specimens taken at quarantine, Washington, D. C., in a shipment of grain from Italy and determined by J. C. Crawford as *distinguendus* Foerster. Comparison of these specimens with Hase's description leaves no doubt as to the correctness of the determination. They also agree in every way with the Howard and Tucker types.

Eupteromalus sarcophagae Gahan.

In the Bulletin of the Brooklyn Entomological Society vol. 12, 1917, p. 118, Mr. A. A. Girault asserts that this species differs "not at all" from *Meraporus dubius* Ashmead.

Types of both species are in the U. S. National Museum and have been compared with the following results:

The postocellar line practically equal to the ocellocular line; malar groove absent; face below the antennae when viewed in profile convexly rounded, distinctly receding, vertex broad, not sharply sloping behind the ocelli; viewed from in front the vertex is very slightly arched above the eyes, the frons deeply, closely sculptured especially in the frontal depression and there are no transverse aciculations on the face below the antennae; the scutellum is convex, or at least not conspicuously flattened, and its apical margin is more weakly sculptured than the remainder

sarcophagae Gahan

Postocellar line distinctly though not a great deal longer than the ocellocular line; malar groove present; face below antennae not so convexly rounded and less receding, vertex not so broad and more sharply sloping behind ocelli; viewed from in front the vertex is more strongly arched above the eyes, the frons is very slightly less deeply punctate and immediately below the base of the antennae are two or three short, very fine, weak, transverse, wrinkles or rugae; the scutellum is distinctly flattened with a narrow transverse apical margin very distinctly more coarsely punctate than the rest of the scutellum *dubius* Ashmead

The two species are undoubtedly congeneric and closely related, but are sufficiently distinct to be recognized as different species, at least until additional material and rearing data establish their identity.

Eupteromalus viridescens Walsh.

Glyphe viridascens Walsh, Trans. Ill. Agr. Soc., 1861, pp. 264 and 370.
Glyphe viridescens Packard, 6th Ann. Rept. Me. Bd. Agr., 1861, p. 6.
Glyphe viridescens Walsh, Trans. Ill. Agr. Soc., 1865, pp. 11 and 483.
Glyphe viridascens Riley, 2nd Ann. Rept. Ins. Missouri, 1870, p. 53, fig. 24.
Glyphe viridascens Riley, 8th Ann. Rept. Ins. Missouri, 1876, p. 53.
Glyphe viridascens Packard, 9th Rept. U. S. Geol. Surv., 1877, p. 706.
Glyphe viridascens Riley, Trans. Ac. Sci. St. Louis, 4, 1881, p. 302 (in part).
Glyphe viridascens Riley, 3rd Rept. U. S. Ent. Comm., 1883, p. 127 (in part).
Glyphe viridascens Riley, Ins. Life, 5, 1892, p. 138.
Glyphe viridascens Lintner, 12th Rept. Ins. New York, 1897, p. 210.
Gastrancistrus viridescens Dalla Torre, Cat. Hym., 5, 1898, p. 205.
Hypopteromalus viridescens Girault, Bull. Wisc. Nat. Hist. Soc., 10, 1912, pp 24–46 (in part).

This species and (*Pteromalus*) *Hypopteromalus tabacum* Fitch were declared to be the same species by Riley (1881, 1883) and later by Girault (1912).

Unfortunately the types of Walsh's species are lost. The national collection contains specimens, however, reared from the army-worm in August, 1875, apparently by Riley, and labelled in Riley's hand "*Glyphe viridascens* Walsh." These specimens are erroneously labelled types. They cannot be the actual Walsh types since the rearing date is some thirteen years subsequent to publication of the description. They do fit Walsh's description perfectly however, and are undoubtedly representatives of the species to which he gave the name *Glyphe viridescens*.

Types of *Hypopteromalus tabacum* Fitch are in the national collection in a fair state of preservation. They disagree in several important particulars with Walsh's description of *viridescens*. According to Walsh *viridescens* is 0.07 of an inch in length, dark green, verging on black in color, the abdomen black. Fitch's *tabacum*, on the other hand, as shown by the types, averages 2.5 mm. in length, is bright blue-green in color with little or no suggestion of blackish on head and thorax, the abdomen more or less blackish in some lights but for the most part highly polished blue-green. There are other slight points of disagreement, but those pointed out are sufficient to demonstrate that what Walsh was describing was not the *tabacum* of Fitch.

If the foregoing conclusion regarding the identity of *viridescens* is correct then it and *tabacum* are not congeneric. The former species has the head, viewed from in front distinctly broader than long, the occiput distinctly margined, the scutellum broad and flattened dorsally, and the abdomen sessile as that term is used in the Pteromalidae. It belongs in the genus *Eupteromalus* Kurdjumov.

The species *tabacum* which is type of the genus *Hypoptermalus* has the head viewed from in front nearly circular the vertex strongly arched above the eyes, the occiput entirely immargined, the scutellum convexly rounded above and the abdomen distinctly petiolate. Until the Pteromalidae undergo a thorough revision the genus *Hypopteromalus* should be retained.

Hypopteromalus tabacum Fitch.

Pteromalus tabacum Fitch, Trans. N. Y. Agr. Soc., 23, 1863, p. 792.
Pteromalus tabacum Fitch, 6th-9th Rept. Ins. New York, 1865, p. 225.
Glyphe viridascens Riley, Trans. Ac. Sci. St. Louis, 1881, p. 302 (in part).
Glyphe viridascens Riley, 3rd Rept. U. S. Ent. Comm., 1883, p. 127 (in part).
Aetroxys tabacum Garman, 3rd Rept. Ky. Exp. Sta., 1890, pp. 35 and 36.
Hypopteromalus tabacum Garman, Kentucky Agr. Exp. Sta., Bull. 66, 1897, p. 28.

Pteromalus tabacum Dalla Torre, Cat. Hym., 5, 1898, p. 150.
Hypopteromalus tabacum Dimmock, Proc. Ent. Soc. Wash., 4, 1898, pp. 149–150.
Hypopteromalus tabacum Ashmead, Smith's Ins. N. Y., 1900, p. 643.
Hypopteromalus tabacum Ashmead, Mem. Carn. Mus., 1, 1904, pp. 320 and 378.
Hypopteromalus tabacum Nason, Ent. News, 17, 1906, p. 152.
Hypopteromalus tabacum Howard and Chittenden, U. S. Bur. Ent. Circ., 96, 1907, p. 5.
Hypopteromalus tabacum Crawford, U. S. Bur. Ent. Techn. Bull., 19, 1910, p. 21.
Hypopteromalus viridescens Girault, Bull. Wisc. Nat. Hist. Soc., 10, 1912, pp. 24–46 (in part).
Hypopteromalus viridescens Webster, Proc. Iowa Acad. Sci., 19, 1912, p. 209.
Hypopteromalus viridiscens Webster, Iowa Agr. Exp. Sta., Bull. 155, 1915, p. 388.
Hypopteromalus tabacum Viereck, Conn. Geol. Nat. Hist. Surv., Bull. 22, 1917, p. 474.

The above citations to literature are all believed to refer to this species. The record by Viereck of this species as a parasite of *Calandra oryzae* is undoubtedly erroneous as it is exclusively a secondary parasite issuing from the cocoons of various species of *Apanteles* and possibly other Ichneumonoidea. (See discussion under *Eupteromalus viridescens*, ante).

FAMILY EULOPHIDAE.

Genus Ceratoneura Ashmead.

Ceratoneura Ashmead, Journ. Linn. Soc. Lond. Zool., 25, 1894, p. 178.
Ceratotetrastichodes Girault, Speciosissima Genera Nova Eulophidarum, Washington, D. C., 1917, p. 2.

In describing *Ceratotetrastichodes* which he bases upon the species *Ceratoneura pretiosa* Gahan, Girault states that this "may not be a genus at all." The writer is of the opinion that this statement is fully warranted. Girault bases the genus entirely upon antennal characters. As shown by the following notes the antenna of *C. pretiosa* does not differ in any essential detail from that of *C. petiolata* Ashmead, genotype of *Ceratoneura*. Neither do the two species differ otherwise in any characters worthy of generic rank and Girault's genus must therefore be considered a synonym.

Ceratoneura pretiosa Gahan.

Ceratoneura pretiosa Gahan, Proc. U. S. Nat. Mus., 48, 1914, p. 165.
Ceratotetrastichodes pretiosa Girault, Speciosissima Genera Nova Eulophidarum, Washington, D. C., 1917, p. 2.

In attempting to correct the description of this species, admittedly incorrect in some respects, Girault has himself erred. A careful examination of slide mounts of the antennae from paratype specimens of both sexes shows the following to be the facts: The female antennae have four ring-joints, three funicle joints and a three jointed club; the first three ring-joints are very small transverse and closely jointed together so that in a dry mounted specimen they appear as one very small joint; the fourth ring-joint is subquadrate, being considerably larger than the three preceding ring-joints combined; the funicle joints are as indicated in the original description; the club is about equal in length to the two preceding funicle joints, the three joints distinct in a balsam mounted specimen but not well separated, the sutures consisting of mere shallow grooves. The male antennae have three small transverse ring-joints (not four as stated by Girault). The funicle appears to be 5-jointed and the club 2-jointed, the funicle joints each with a whorl of long hairs. In the original description the statement was made that "the funicle is really but 3-jointed, the first ring-joint being greatly elongate and the basal joint of the club resembling the funicle joints." This statement is wrong since it is the last ring-joint, not the first, which is elongate. The apparent fifth funicle joint is believed to be merely the basal joint of club more than usually detached and modified to resemble a funicle joint. Only in this manner can the antennae of the male and female be homologized.

Ceratoneura petiolata Ashmead.

Examination of a slide mount of the female antenna of this species shows it to have apparently four ring-joints similar to those in *pretiosa, viz.*, the first three short and transverse while the fourth is large and subquadrate; the three basal ring-joints are even more closely joined and indistinct than in *pretiosa;* the funicle consists of three subequal joints each approximately one and one-half times as long as thick, the middle joint very slightly the longest in the specimen examined; the club is shorter than the two preceding funicle joints combined, indistinctly 3-jointed, the sutures, especially the last, very indistinct. The male funicle is 5-jointed and club 2-jointed; first funicle joint only slightly longer than broad and much shorter than the second which is fully twice as long as thick; following joints of funicle decreasing slightly in length toward the apex; club shorter than the two preceding funicle joints combined, its first joint much longer than the second, all funicle joints with a basal whorl of long hairs.

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